

We claim:

1. A method for treating a subject having allergic asthma, the method comprising:
  - (a) identifying a subject having allergic asthma, and
  - 5 (b) administering to the subject a pharmaceutical composition comprising a chimeric polypeptide that comprises a first polypeptide domain comprising at least one moiety that specifically binds to a chemokine receptor 5 (CCR5); and, a second polypeptide domain comprising at least one of (a)-(d): (a) a moiety that binds to a T cell surface polypeptide, (b) a moiety that binds to a dendritic cell surface polypeptide, (c) a moiety that binds to a cell toxin,
  - 10 and (d) a cell toxin,

wherein the chimeric polypeptide is administered in an amount, and for a time, sufficient to achieve one or both of: (i) a reduction of CCR5(+) cells in the lung, and (ii) a significant reduction or substantial depletion of macrophages in the lung.
- 15 2. The method of claim 1, wherein CCR5(+) cells are selected from the group consisting of T cells, B cells and NK cells.
3. The method of claim 1, wherein the subject has or is at risk for chronic allergic asthma.
- 20 4. The method of claim 1, wherein the subject is a human.
5. The method of claim 1, wherein the moiety that specifically binds to CCR5 comprises a RANTES or a fragment thereof.
- 25 6. The method of claim 1, wherein the moiety that specifically binds to CCR5 comprises a MIP-1 $\alpha$  or a fragment thereof.
7. The method of claim 1, wherein the second polypeptide domain comprises a cell toxin.
- 30 8. The method of claim 7, wherein the cell toxin is cross-linked to the chimeric polypeptide.

9. The method of claim 1, wherein the chimeric polypeptide comprises a recombinant fusion protein.

10. The method of claim 1, wherein the moiety that specifically binds to the CCR5 comprises an antigen binding domain derived from an antibody that specifically binds to the CCR5.

11. The method of claim 1, wherein the moiety that binds to a T cell surface polypeptide or a dendritic cell surface polypeptide comprises an antigen binding domain derived from an antibody that specifically binds to the T cell surface polypeptide or dendritic cell surface polypeptide.

12. The method of claim 11, wherein the T cell surface polypeptide is CD3.

13. The method of claim 1, wherein the dendritic cell surface polypeptide is an Eo1 chemokine receptor.

14. The method of claim 1, wherein the chimeric polypeptide comprises a first polypeptide domain that specifically binds to CCR5, and a second polypeptide domain that comprises a cell toxin.

15. The method of claim 14, wherein the first polypeptide domain comprises a RANTES or a CCR5-binding fragment thereof.

16. The method of claim 1 or 14, wherein the cell toxin comprises a *Pseudomonas* exotoxin.

17. The method of claim 16, wherein the *Pseudomonas* exotoxin comprises a PE38 exotoxin, a PE40 exotoxin or a PE37 exotoxin.

18. The method of claim 1 or 14, wherein the cell toxin comprises a diphtheria toxin.

19. The method of claim 1, wherein the method further comprises the step of evaluating at least one symptom of allergic asthma in the subject.

20. The method of claim 19, wherein the symptom is IgE levels, goblet cell hyperplasia, peribronchial inflammation, recruitment of inflammatory leukocytes, recruitment of macrophages, airway hyperresponsiveness, coughing, wheezing, chest tightness, dyspnea, airway smooth muscle contraction, bronchial mucus secretion, inflammation, vasodilation, or release of inflammatory mediators.

21. The method of claim 1, further comprising the step of determining whether the administration of the chimeric polypeptide reduced the severity or initiation of one or more symptoms of allergic asthma in the subject.

22. The method of claim 1, wherein the chimeric polypeptide is administered once a day for a period of at least 7 days.

23. The method of claim 1, comprising administering to the subject a short course of treatment of the chimeric polypeptide.

24. The method of claim 1, wherein the treatment is begun at about the time of exposure, shortly after the time of exposure or suspected exposure or prior to impending exposure.

25. The method of claim 1, wherein the chimeric polypeptide is administered at a unit dose of between 10 ng and 150 µg per kg of body weight of the subject.

26. The method of claim 1, wherein the chimeric polypeptide is administered in combination with a corticosteroid, bronchodilator, leukotriene antagonist, anti-inflammatory agent or therapeutic antibody.

27. The method of claim 1, wherein the chimeric polypeptide is formulated for intranasal, intratracheal, intrabronchial, intravenous or subcutaneous administration.

28. A method for substantially reducing or depleting macrophages in a subject, the method comprising:

(a) identifying a subject in need of reducing macrophages, and

(b) administering to the subject a pharmaceutical composition comprising a chimeric

polypeptide that comprises a first polypeptide domain comprising at least one moiety that specifically binds to a CCR5; and, a second polypeptide domain comprising at least one of (a)-(d): (a) a moiety that binds to a T cell surface polypeptide, (b) a moiety that binds to a dendritic cell surface polypeptide, (c) a moiety that binds to a cell toxin, and (d) a cell toxin.

29. The method of claim 28, wherein the subject has allergic asthma.

30. The method of claim 28, wherein the subject has atherosclerosis.

31. The method of claim 28, wherein the subject has multiple sclerosis.

32. The method of claim 28, wherein the subject is a human.

33. The method of claim 28, wherein the moiety that specifically binds to CCR5 comprises a RANTES or a CCR5-binding fragment thereof.

34. The method of claim 28, wherein the second polypeptide domain comprises a cell toxin.

35. The method of claim 28, wherein the moiety that specifically binds to the CCR5 comprises an antigen binding domain derived from an antibody that specifically binds to the CCR5.

36. The method of claim 28, wherein the chimeric polypeptide comprises a first polypeptide domain that specifically binds to CCR5, and a second polypeptide domain that comprises a cell toxin.

37. The method of claim 34, wherein the cell toxin comprises a *Pseudomonas* exotoxin or a diphtheria toxin.

38. The method of claim 28, comprising administering to the subject a short course of treatment of the chimeric polypeptide.

39. The method of claim 28, comprising administering to the subject a course of treatment of the chimeric polypeptide begun at about the time of exposure, shortly after the time of exposure or suspected exposure, or prior to impending exposure.

40. The method of claim 28, wherein the chimeric polypeptide is formulated for intranasal, intratracheal, intrabronchial, intravenous or subcutaneous administration.

41. A method for treating allergic asthma in a subject, the method comprising:

- (a) identifying a subject having allergic asthma, and
- (b) administering to the subject a course of treatment with a pharmaceutical composition comprising a chimeric polypeptide that comprises a first polypeptide domain comprising at least one moiety that specifically binds to a CCR5; and a second polypeptide domain comprising at least one of (a)-(d): (a) a moiety that binds to a T cell surface polypeptide, (b) a moiety that binds to a dendritic cell surface polypeptide, (c) a moiety that binds to a cell toxin, and (d) a cell toxin.

42. The method of claim 41, wherein the course of treatment is a short course treatment.

43. The method of claim 41, wherein the course of treatment is begun at about the time of exposure, shortly after exposure or suspected exposure, or prior to impending exposure.

44. The method of claim 41, wherein the subject is a human.

45. The method of claim 41, wherein the moiety that specifically binds to CCR5 comprises a RANTES or a fragment thereof.

46. The method of claim 41, wherein the second polypeptide domain comprises a cell toxin.

47. The method of claim 41, wherein the chimeric polypeptide comprises a first polypeptide domain that specifically binds to CCR5, and a second polypeptide domain that comprises a cell  
5 toxin.

48. The method of claim 46 or 47, wherein the cell toxin comprises a *Pseudomonas* exotoxin or a diphtheria toxin.

10 49. The method of claim 41, wherein the method further comprises the step of evaluating at least one symptom of allergic asthma in the subject.

50. The method of claim 41, wherein the short course of treatment is of a duration equal to or less than 15 days.

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51. The method of claim 41, wherein the chimeric polypeptide is administered in combination with a corticosteroid, bronchodilator, leukotriene antagonist, anti-inflammatory agent or therapeutic antibody.

20 52. The method of claim 41, wherein the chimeric polypeptide is formulated for intranasal, intratracheal, intrabronchial, intravenous or subcutaneous administration.

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